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SOVIET APPARATUS FOR SUTURING BLOOD VESSELS

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During World War II, suturing of blood vessels was performed only by surgeons who were adept in this particular technique. Although many of the wounded having injuries of large blood vessels were saved, most surgeons were unable to do fine surgery on blood vessels, particularly under the conditions imposed by war and existing in the field. This state of affairs served as a stimulus to the development of a new surgical appliance for suturing.

The work in question, which has been successfully completed, was done by a group of engineers and physicians headed by V. F. Gudov, Engineer-Designer of the All-Union Scientific Research Institute of Medical Instrumentation and Equipment and Surgeon P. I. Andrusov of the /First Aid/ Institute imeni Sklifosovskiy.

The apparatus developed by this group represents a considerable advance in the technique of vascular surgery. It can be used not only by specialists but also by any ordinary surgeon.

For applying annular sutures to blood vessels with varying wall thicknesses and ranging in diameter from 1.4 to 12 mm, three appliances of different dimensions are provided. The three appliances differ only in their dimensions: they work in exactly the same manner. The small and medium apparatus have four sets of interchangeable sleeves each. The small apparatus is used for suturing blood vessels 1.4-4 mm in diameter, the medium apparatus for vessels 4-8 mm in diameter. The large apparatus is used for vessels 8-12 mm in diameter and is equipped with three sets of interchangeable sleeves. Each apparatus is provided with the following additional parts: two clamps for stopping blood flow; a quantity of flanges corresponding to the number of sleeves; magazines corresponding in quantity to the number of sleeve sets; two anatomical eye clamps ("pincettes"); a set of collars; and a set of clips. With the complete set is included one single clip, multicharge apparatus for applying longitudinal sutures to blood vessels.

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The ends of the blood vessel, after being suitably prepared, are sutured by means of the apparatus with clips made of tantalum wire. Tantalum wire of varying diameter (100-150-200μ) is used, depending on the diameter of the blood vessels being sutured. After suturing, the tantalum clips do not protrude into the lumen of the vessels. In the spots where the vessels have been transfixed by the clips, the blood flows freely and unimpeded over the clips. The diameter of the vessel which has been sutured is neither increased nor decreased.

Beyond the time required for preparing the vessel, the process of suturing takes only a fraction of a second. The appliance is operated by pressing a lever. Clinical tests carried out at the Institute of Surgery imeni Professor Vishnevskiy, Academy of Medical Sciences USSR, the Neurosurgical Clinic of the Military Medical Academy imeni S. M. Kirov, the Institute imeni Sklifosovskiy, and elsewhere demonstrated the high efficiency of the new apparatus.

Gudov's apparatus opens up wide perspectives, not only as far as surgical operations on blood vessels are concerned, but also in such fields of clinical and experimental surgery as the grafting of blood vessels and transplantation of organs.

A detailed description of the new method is given in Novyy Sposob Soedineniya Krovenosnykh Sosudov (A New Method of Joining Blood Vessels), by V. F. Gudov, Medgiz, Moscow, 1950.

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